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Rotman International Journal of Pension Management | Volume 1 • Issue 1 Fall 2008

The Pension Fund Advantage: Are Canadians Overpaying their Mutual Funds?

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The institutional structure through which individuals accumulate retirement savings is an important issue. Ideally, it is expert and low-cost. This article compares the cost-effectiveness of the pension fund structure with the mutual fund structure. The authors hypothesize that the pension fund structure provides investment management services at lower cost because most mutual funds are conflicted between providing good financial results for their clients and good financial results for their shareholders. Specifically, they compare the investment performance of a sample of domestic fixed income portfolios of Canadian pension funds with those of a sample of Canadian fixed income mutual funds. They find an average performance differential of 1.8 percent per annum in favor of pension funds. This performance gap is approximately equal to the average cost differential between the two approaches. They conclude that high mutual fund fees significantly reduce the net returns of mutual fund investors.

The Ongoing Mutual Fund Debate

An ongoing debate in academia questions the prospects for individuals who invest their savings in mutual funds. The inherent conflict of interest between mutual fund managers and mutual fund investors is often cited as a value reducer. In this issue, Bogle (2008), makes reference to this fact. Ambachtsheer and Bauer (2007) also make the case with Canadian equity mutual funds, documenting a significant gap in performance between Canadian pension plan equity portfolios and Canadian equity mutual funds. They conclude that Canadian retail investors are paying too much for the management of their equity mutual funds. In the United States, similar results are documented by Bauer and Frehen (2008), who show that average American pension funds' equity performance matches the benchmark, while the average American equity mutual fund underperforms. Since risk, size and cost differences do not account for the performance gaps, the authors conclude that the performance of mutual funds is hampered by agency costs due to their inherent nature as for-profit organizations.

In this article, we offer new insights into the agency costs debate by examining the performance of fixed income portfolios of Canadian pension funds and mutual funds. Using the same sample of pension funds as Ambachtsheer and Bauer (2007), we compare the performance of domestic fixed income portfolios of 211 Canadian Defined Benefit (DB) pension plans to a sample of 312 Canadian fixed income mutual funds during the period 1997-2004. The fixed income performance is measured as net value added (alpha), which can be defined as the return of the fixed income portfolio, minus the benchmark return and costs involved. Empirical results indicate that the average fixed income mutual fund in Canada underperforms the average fixed income portfolio of pension funds by around 1.8 percent a year. Net returns of pension plans are close to benchmark returns, whereas fixed income mutual funds underperform the benchmark. More specifically, the risk-adjusted net return differential between pension plans and mutual funds is equal to the difference in cost levels. These findings are fully consistent with the previous findings by Ambachtsheer and Bauer (2007). Overall, these results corroborate earlier findings that Canadian investors are overpaying their mutual funds.

Limited Historical Results

Existing literature on the fixed income performance of Canadian DB pension plans and mutual funds is limited. In fact, not a single study explicitly examines the fixed income performance of Canadian DB pension plans. Academia tends to overlook

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performance measurement of Canadian fixed income mutual funds as well. One exception is the study by Kryzanowski and Lalancette (1996) that examines the performance of a small sample of funds during 1981-1988. In this study, they conclude that fixed income mutual funds in Canada are unable to recoup their expenses. Ayadi and Kryzanowski (2004) confirm these findings in a sample of 126 funds during 1985-2000.

The poor performance of the Canadian mutual fund industry can in part be explained by research by Khorana, Servaes and Tufano (2007), who collectively find that Canadian equity and fixed income mutual funds have the world's highest expense ratios. The relation between net performance and expense ratios is found to be especially strong in case of fixed income mutual funds. The Canadian findings are consistent with the conclusions of mutual fund studies in the United States. The first in-depth study on American fixed income mutual funds performance is conducted by Blake, Elton and Gruber (1993). Using single and multi-factor models, they conclude that fixed income funds underperform by the charged expense ratios. The most recent study by Huij and Derwall (2007) shows that only top performing funds are able to match benchmark returns.

The Data for the Comparative Performance Study

Toronto-based CEM Benchmarking (CEM) provided the pension fund data[1]. As discussed in Bauer and Frehen (2008), CEM offers a diverse database of pension fund data on United States, Canadian, European and Australian funds. CEM collects this data by sending out annual questionnaires to pension funds. Approximately 211 Canadian DB plans have reported to CEM from 1992 until 2004. The database covers almost 70 percent of all Canadian DB plan pension assets. The strength of the CEM database is that it contains fund specific information, making it highly suitable for investigating the execution of investment mandates and circumventing the crude benchmark specification of earlier studies. For each fund, the database specifies its yearly return series, its costs breakdown and its benchmark return. The reported costs include direct investment management, oversight, custodial, consulting and performance, audit and other oversight costs. For each fund, the database provides detailed information on the size of the holdings, the asset classes and the investment styles. Within this article, we focus on domestic fixed income portfolios of Canadian pension funds.

Figure 1: Data Structure Pension Funds

This figure shows the data structure of pension funds. Funds are categorized according to investment styles, type and duration. Funds are either managed internally, externally, actively, or passively. In addition, pension funds can either be corporate funds, or public pension funds. Furthermore, funds can have a universe maturity strategy or a long maturity strategy.

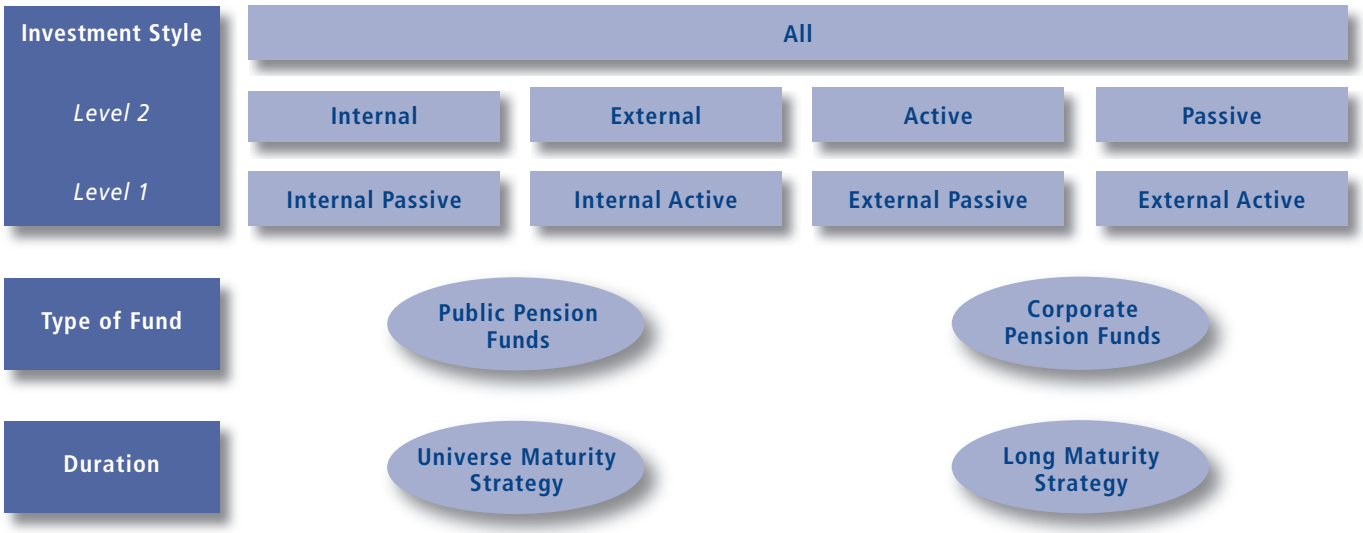

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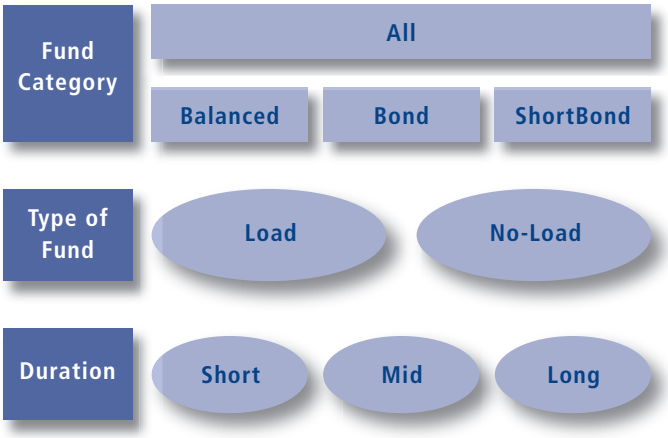
Figure 1 displays the data structure of portfolios in the CEM pension fund database. The data is split by investment style and type of fund. The database reports on Level 1 of investment style per asset class. To get to Level 2 in the data structure, holdings are aggregated and returns are calculated as value weighted averages of lower level returns. The highest level (All) encompasses all investment styles and subsequently, all funds. The grouping of funds according to type of fund (public or corporate) is also valuable, for it could be a potential performance driver. A number of funds is neither classified as public nor corporate. These are not considered in the type of fund analysis. Furthermore, funds are grouped according to duration. Although the database does not explicitly mention the duration style of portfolios, the benchmark reported by each fund partly reveals the duration style. Based on this, we divide funds into duration classifications. The majority of funds either employs a universe bond benchmark covering all maturities, or a long bond benchmark covering long term maturities. A minority of funds reports a mid bond benchmark, covering mid term maturities. This class is too small to prompt any conclusions[2].

The mutual fund data is retrieved from Globefund. This database includes all available domestic fixed income mutual funds in Canada in 2006, excluding earlier funds that did not survive until 2006. As a result, the database suffers from survivorship bias that can overestimate the performance of mutual funds. In total, 312 fixed income mutual funds are identified. We choose funds tagged Canadian Balanced (Fixed Income), Canadian Bond and Canadian Short Term Bond as the sample of fixed income mutual funds. The first class of funds holds close to 80 percent in Canadian bonds and 20 percent Canadian equity, whereas the latter two classes hold close to 100 percent in Canadian bonds. The Canadian Bond classification is best comparable to the DB fixed income portfolios, as it encompasses all maturities. The final dataset consists of annual returns in the period 1997-2004 complemented with total expense ratios (TER), net asset values and load charges. The TER includes management and trailer fees, as well as administrative, legal, audit and other operational costs. It excludes non-annual distribution fees, like front-end and back-end loads.

The database is segmented according to the fund categories previously mentioned, whether these charge loads or not, and, duration. The duration style is provided by Globefund. Figure 2 displays the final data structure for mutual funds. Each classification is placed side by side against its most suitable benchmark index of Scotia Capital (SC), which has a long reputation for providing bond benchmarks in Canada. Canadian Bond funds are benchmarked against the SC Universe Bond Index, Canadian Short Term Bond funds against the SC Short Bond Index and Canadian Balanced (Fixed Income) funds against a blend index, which consists of 80 percent SC Bond Universe and 20 percent Toronto Stock Exchange (TSE) 300. The different duration classes (Short, Mid, and Long) are compared to the SC Short Bond Index, the SC Mid Bond Index and the SC Long Bond Index respectively. The selection criteria of fixed income mutual funds are similar to those of DB pension plans.

Figure 2: Data Structure Mutual Funds

This figure shows the data structure of mutual funds. Funds are divided according to category, type and duration. Mutual funds are either Canadian Balanced funds (Fixed Income), Canadian Bond funds (Bond) or Canadian Short Term Maturities funds (Short Bond). In addition, funds are categorized according to whether or not they charge non-annual loads (Load; No-Load). Furthermore, funds can focus on short (Short), mid (Mid) or long term (Long) maturities.



For better insight into the sample of pension and mutual funds, Tables 1 and 2 provide an overview of the database structure. Table 1 shows the number of pension funds in the original (Panel A) and the modified database (Panel B) where outliers are removed. On average, 90 funds report to CEM. Most of the pension plans are corporate funds and most fixed income investments are externally managed, active portfolios. The number of fixed income mutual funds in Canada is increasing through time. Since the Globefund mutual fund database is a fixed snapshot of the Canadian fixed income mutual fund universe in 2006, we should be careful with how we interpret this finding. The majority of mutual funds is a Bond fund with medium term maturity and loads. Table 2 provides information on the size of the holdings of pension fund fixed income portfolios. Internally managed, active portfolios have the largest holdings size. Over time, DB plans show an increased tendency for external management. As far as duration style goes, most pension funds follow a universe investment strategy that focuses on different bond maturities.

Table 1: Pension and Mutual Funds Data

This table reports the number of pension and mutual funds in the database each year. Panel A (Original Pension Fund Sample) displays characteristics of the original pension fund database. Panel B (Modified Pension Fund Sample) and Panel C (Mutual Fund Sample) show characteristics after the selection procedure has been applied, see Bauer and Frehen (2008) for more details. Since the selection procedure is applied to each classification level separately, the classification levels do not add up to the 'All' level.

	'97	'98	'99	'00	'01	'02	'03	'04
Panel A: Original Pension Fund Sample								
All	97	104	110	105	98	97	94	88
Panel B: Modified Pension Fund Sample								
All	91	97	102	97	93	90	86	78
Int	24	21	21	19	22	24	22	22
Ext	75	81	88	84	80	75	71	64
Act	84	89	95	88	81	79	75	70
Pas	22	29	34	37	36	36	33	29
Pub	29	28	28	27	30	33	27	22
Corp	49	53	60	55	48	41	40	39
Uni	82	86	87	83	77	73	69	60
Long	5	5	10	11	11	13	13	13
Panel C: Mutual Fund Sample								
All	108	121	153	178	204	227	248	246
Bond	76	88	110	129	146	163	179	177
Balanced	2	2	5	9	10	13	17	17
Short Bond	30	33	38	41	48	51	51	51
Load	53	60	86	107	123	144	153	153
No-Load	55	62	68	71	77	82	93	92
Short	31	35	41	44	52	55	58	57
Mid	66	75	98	118	133	148	167	165
Long	11	13	14	17	18	21	23	22

Source: CEM, Globefund

Table 2: Holding Characteristics of Pension and Mutual Funds

This table reports the percentage of cross-sectional holdings for pension and mutual funds.

	'97	'98	'99	'00	'01	'02	'03	'04
Pension Funds								
Int	73.8	71.5	70.6	71.1	70.4	68.0	69.3	68.7
Ext	26.2	28.5	29.4	28.9	29.6	32.0	30.7	31.3
Act	91.7	91.0	90.6	88.1	86.3	89.9	91.1	91.6
Pas	8.3	9.0	9.4	11.9	13.7	10.1	8.9	8.4
Pub	68.4	63.6	65.9	66.8	68.7	69.0	72.0	67.9
Corp	22.9	27.1	25.3	22.4	25.1	25.8	20.6	23.0
Uni	68.4	63.6	65.9	66.8	68.7	69.0	72.0	67.9
Long	2.6	2.6	4.3	4.9	4.5	5.2	7.2	7.3
Mutual Funds								
Bond	77.1	78.3	77.7	77.8	79.5	79.5	78.9	78.9
Balanced	0.1	0.1	1.3	1.8	1.7	1.9	2.7	2.7
Short Bond	22.8	21.6	21.0	20.5	18.8	18.6	18.4	18.4
Load	32.7	31.1	33.3	34.5	36.9	37.2	37.1	37.1
No-Load	67.3	68.9	66.7	65.5	63.1	62.8	62.9	62.9
Short	22.7	21.5	21.3	20.8	20.0	19.8	19.8	19.8
Mid	62.8	64.6	65.4	66.0	68.1	68.3	68.5	68.5
Long	14.5	13.9	13.3	13.2	11.9	11.9	11.7	11.7

Source: CEM, Globefund

Net Value Added as a Performance Metric

Net performance of fixed income portfolios is measured as Net Value Added (NVA). It is defined as a fund's net return, minus the return on the fund's benchmark over the same period of time. To account for differences in expense ratios between funds, Gross Value Added (GVA) is also calculated. This is defined as the difference between a fund's gross return and the return of the benchmark over the same period. Average performance (NVA_{MEAN}) is determined by simply averaging across all time-fund combinations[3,4].

The calculated NVAs have to be adjusted to suit the risk appetite of the manager. An investment grade fund manager could seek over-performance by investing in riskier, low credit securities. Under certain circumstances, this manager can outperform peers who stay with to the universe of low risk investment grade bonds. In the risk-adjusted analysis, NVAs are adjusted for the three risk factors identified by Blake et al. (1993): the exposure to the overall bond market, to high yield bonds and to mortgage backed securities. The mortgage backed securities are included as a separate risk class, because of its option-like characteristics[5].

Study Findings

Here we present NVA calculations for pension and mutual funds. Table 3 reports the results of the standard analysis. Fixed income portfolios of pension funds (All) show a performance slightly above the benchmark net of costs, whereas fixed income mutual funds (Bond)[6] underperform the benchmark considerably, net of costs. More specifically, pension funds (All) outperform by seven basis points and mutual funds (Bond) underperform by 174 basis points. This performance

is consistent throughout the classification levels of the pension fund sample, as in each sub-sample the average NVA is close to zero. T-statistics indicate that only the fixed income holdings of public pension plans in the CEM sample significantly outperform the benchmark by 19 basis points.

The underperformance of fixed income mutual funds corroborates earlier Canadian research. Clearly, the underperformance of 174 basis points (Bond) is mainly due to the average cost level of 169 basis points (Bond). The expense ratio closely matches the average expense ratio of 179 basis points found in Khorana et al. (2007). Table 3 also shows that the net underperformance is close to cost levels for all other classification levels. Only balanced funds are able to recoup part of their costs, and long duration funds underperform by more than their cost levels. The results previously mentioned make it obvious that the discrepancy in cost levels is the main contributor to the difference in NVA between pension plans and mutual funds. Figure 3 displays cross sectional NVAs over time. It shows that the gap in NVA between pension plans and mutual funds is consistent over time and on average, equal to the cost differential.

Table 3: Performance of Pension and Mutual Funds

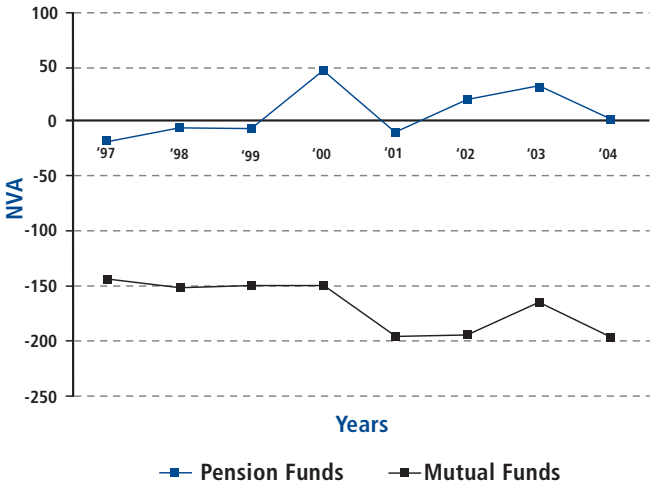
This table displays the mean Net Value Added (NVA) for pension and mutual funds. Further, the table provides the number of time-fund combinations (NT), the size of the holdings (Size Hold), total costs (Costs), and GVA (GVA). The reported standard deviation (s.d.) is the standard deviation between all observable NVAs. The maximum (Max) and minimum (Min) is the highest and lowest observable NVA. NVA, Costs and GVA are reported in basis points. Holdings are reported in million Canadian dollars.

	NT	NVA	s.d.	T-stat	Max	Min	Size Hold	Costs	GVA
Pension Funds									
All	734	6.5	90.8	1.9	401.9	-423.0	1213.1	12.4	18.9
Int	175	20.2	137.7	1.9	778.7	-423.0	3549.5	4.9	25.1
Ext	618	3.3	83.9	1.0	368.8	-290.1	435.9	14.3	17.6
Act	661	5.1	95.8	1.4	368.8	-423.5	1215.0	14.7	19.7
Pas	256	-3.6	100.2	-0.6	549.6	-443.9	298.9	5.1	1.5
Pub	224	18.7	100.4	2.8	478.1	-366.9	2702.5	9.8	28.4
Corp	385	0.8	89.2	0.2	368.8	-423.0	572.0	13.9	14.8
Uni	617	5.2	86.9	1.5	401.9	-301.1	1126.4	12.8	18.1
Long	81	7.5	101.0	0.7	308.6	-423.0	537.5	11.4	18.9
Mutual Funds									
Bond	1068	-173.6	145.2	-39.1	441.0	-727.0	384.6	169.2	-4.4
Balanced	75	-156.3	297.5	-4.5	744.0	-742.0	114.2	238.3	81.9
Short Bond	343	-162.3	131.8	-22.8	264.0	-594.0	309.9	160.9	-1.4
Load	879	-204.4	137.6	-44.0	432.0	-694.0	211.6	195.6	-8.8
No-Load	600	-121.9	155.4	-19.2	540.0	-742.0	566.0	134.1	12.2
Short	373	-167.3	129.7	-24.9	264.0	-605.0	295.7	159.7	-7.6
Mid	970	-212.8	167.5	-39.6	466.0	-1011.0	365.8	176.9	-35.9
Long	139	-273.4	367.3	-8.8	1258.0	-1378.0	464.5	151.5	-121.9

Source: CEM, Globefund

Figure 3: Performance over Time

This figure shows the evolution of cross-sectional Net Value Added over time. NVA is displayed in basis points.

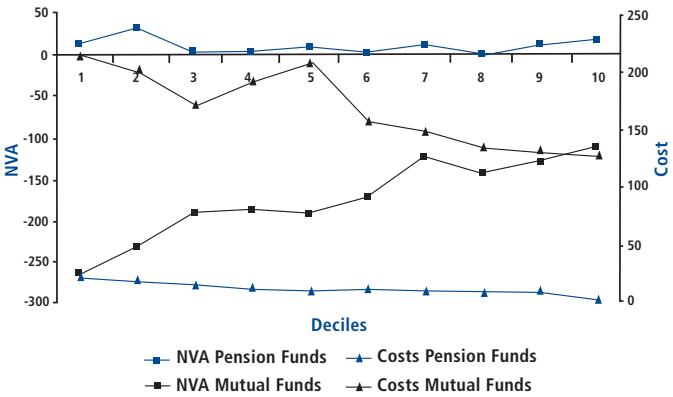


Source: CEM, Globefund

Apart from differences in cost levels, the findings of the standard analysis also need to be adjusted for the size difference between pension and mutual funds. Pension funds' average holdings size is C$1,213 million. Mutual funds (Bond) have average holdings of C$385 million. Economies of scale could be a potential performance driver, so a size matched mutual fund sample is constructed. Mutual funds are ranked into equally sized deciles. We use the relevant size matched decile (Decile 9) in our further analysis.

Figure 4: Performance and Costs over Size Deciles

This figure shows the evolution of the NVA and costs for pension and mutual funds over size deciles. Decile 1 includes the 10% smallest funds; Decile 10 includes the 10% largest funds. The pension and mutual funds' deciles do not match in size. NVA and costs are in basis points.

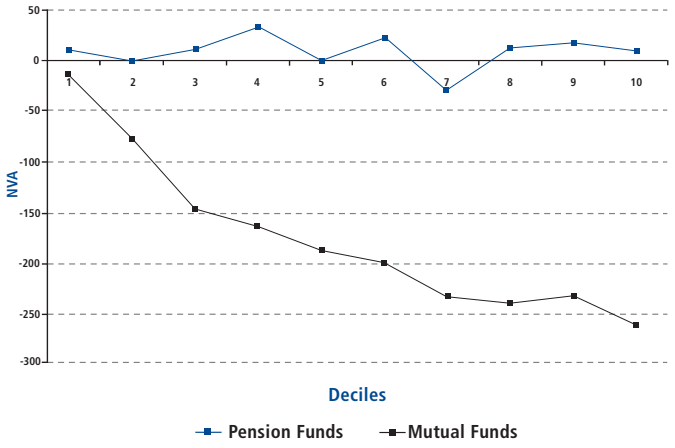


Source: CEM, Globefund

Figure 4 presents NVAs and cost levels for the various size deciles. All deciles, including Decile 9, underperform by their cost levels. Any improvement in NVA due to increasing size can be attributed to the reduction in cost levels. The strong relation between costs and NVA is also confirmed by creating cost deciles. Figure 5 shows that low cost mutual funds are the best performing funds. Due to small cross-sectional differences in cost levels across pension funds, the relationship between costs and NVA is not significant for pension funds.

Figure 5: Performance over Cost Deciles

This figure shows the Net Value Added for pension and mutual funds over cost deciles. Decile 1 includes the 10% cheapest funds; Decile 10 includes the 10% most expensive funds. Pension and mutual funds' deciles do not match in size. NVA and costs are displayed in basis points.



Source: CEM, Globefund

The Pension Fund Advantage

In many ways, these results provide food for thought. Pension plan participants earn a significantly higher return on fixed income holdings than mutual fund investors. Pension plan net returns are very close to benchmark returns, whereas mutual funds underperform by their high cost levels. Controlling for risk and size differences does not change this result: the net performance differential is mainly caused by the discrepancy in cost levels between pension plans (0.12 percent) and mutual funds (1.69 percent). This empirical finding is fully consistent with earlier findings and confirms the notion that Canadian mutual funds have relatively high expense ratios.

High cost levels offer no additional value to investors. Front-end and back-end loads, which are not included in our analysis, will further reduce the net returns of a mutual fund investor.

Participants of pension funds pay considerably less than individuals for institutional asset management services and are protected from the many sales strategies mutual fund companies employ. Moreover, pension funds exercise their bargaining power to reduce expense ratios in external mandates. Unfortunately, mutual fund investors lack this advantage. The implications for individual Canadians saving for retirement are clear: think twice before allocating your retirement savings to mutual funds.

Endnotes

1. Special thanks are directed to CEM Benchmarking Inc. (CEM) for providing the data on the Canadian DB pension plans.

2. Not all time-fund combinations reported in the CEM database are used. The same selection procedure is taken as in Bauer and Frehen (2008).

3. This is defined is as follows: $NVA_{MEAN} = \frac{1}{\sum_{i=1}^{N} T_i} \sum_{i=1}^{N} \sum_{t=1}^{T_i} I_{i,t} NVA_{i,t}$, where $I_{i,t}$ is a dummy for fund *i* in year *t*, which has a value of one if the fund does report and zero if the fund does not report. T_i is the total number of years fund *i* is present in the database. T is the maximum number of time periods; N is the total number of funds.

4. For robustness, NVA_{MEAN} is also computed by averaging the average time series NVA across funds, and by taking the average of the cross-sectional NVA of each year. These estimations are not reported, as the results diverged only minimally.

5. The model is specified as follows:
$NVA_{i,t} = \alpha_i + \beta_{BIG,i} BIG_t + \beta_{HY,i} HY_t + \beta_{GNMA,i} GNMA_t + \varepsilon_{i,t}$, where BIG_t is a proxy for the excess returns of the overall bond market, HY_t is a proxy for the excess returns from holding low-grade debt, and $GNMA_t$ is a proxy for the excess returns of mortgage backed securities. All factors are estimated by indices of Scotia Capital. The SC Bond Universe Index is used as a proxy for the overall bond market. The SC BBB Universe Index is taken as a proxy for the low-grade debt and the SC Mortgage Backed Securities Index for mortgage backed securities. The one-month Canadian Treasury Bill is taken as the riskless rate. To estimate the model, the random coefficients model of Hsiao (2003) is applied. The risk adjusted results are not reported, as the results diverged only minimally. The estimations are consistent with the results presented in the article.

6. As explained in section 3, the Bond category is best comparable to the fixed income portfolios of pension funds.

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